HP-41CV Quick Reference

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Overview

←	RUN mode: Clear last entered digit ot entire X-register PRGM mode: Delete currently displayed program instruction
USER	Turn user mode on/off. In user mode, every key can possibly be programmed to perform some specific internal or programmed function. See the ASN command.
PRGM	Turn programming mode on/off. Use „GTO .." to pack program memory and jump to the beginning of unused space. In PRGM mode „00 REG nn" will be displayed where nn is the number of available registers for program data.
ALPHA	Turn ALPHA (string entry) mode on/off. On the back of the calculator is a list of charcters that can be reached by the yellow prefix key.
Memory	319 registers. Initially 46 registers are program space and 273 registers are available for variable storage. One register can approximately hold 6 program steps, so initially there are 276 program steps available. When the number of storage registers is reduced to 10 using „SIZE 010" then 309 registers are available for programs corresponding to 1854 program instructions.
Available functions	Use the CAT command to get a list of internal and external functions. Use XEQ ALPHA <name> ALPHA to execute a command which is not directly available on the keyboard. Use the same sequence to enter such commands in a program!
Indirect addressing	See RCL command

Command Reference

+	Add Y + X → X
-	Subtract Y − X → X
x	Multiply Y * X → X
/	Divide Y / X → X
1/x	Reciprocal value
10↑x	Exponential function base 10
ABS	Absolute (positive) value of X
ACOS	Inverse Cosine using current trigonometry mode
AOFF	ALPHA mode off
AON	ALPHA modem on. Using the SHIFT key various special keys and functions can be accessed. See on the back of the calculator. The ALPHA register can hold up to **24 characters**. PRGM mode: A program line can only hold at most **15 characters**. To put a longer string into the ALPHA register use two program lines and start the second one with "SHIFT K" which is the APPEND command

ARCL	Append the value of the data register nn to the ALPHA register. A data register or a stack register can hold at most **6 characters**. Note that if ALPHA data is stored in a data or stack register the ALPHA mode of the data will be preserved. An error occurs if a numerical function is executed on ALPHA data. See RCL for indirect addressing modes.
ASHF	Shift ALPHA register 6 characters to the left. Left 6 characters are lost
ASIN	Inverse Sine using current trigonometry mode
ASN	Assign a function or program to an arbitrary key for use in USER mode: "ASN ALPHA <func name/program name> ALPHA <key>". Or "ASN ALPHA <func name/program name> ALPHA SHIFT <key>" in which case "SHIFT <key>" executes the command. To undo the assignment: "ASN ALPHA ALPHA [SHIFT] <key>" See also command LBL for top-row auto-execution
ASTO	Store leftmost 6 characters of the ALPHA register in data register nn. See RCL for indirect addressing modes. See ARCL for more information on ALPHA data
ATAN	Inverse Tangent using current trigonometry mode
AVIEW	Display the ALPHA register until a key is pressed
BEEP	Play a fixed short melody
BST	PRGM mode: Go to previous program step. RUN mode: Go to previous program step but do not execute any commands.
CAT	CATALOG list functions: CAT 1: Global program labels. Global programs are separated by END instructions. Press PRGM to edit the currently listed program CAT 2: Functions in expansion modules CAT 3: Built-in functions CAT 0, 4-9: Same as CAT 3 R/S halts the listing, SST shows next entry, BST shows previous entry. See RCL for indirect addressing modes
CF	Clear flag nn. See RCL for indirect addressing modes. Flags are: 00-10: General purpose flags where flags 0-3 are shown in the LCD display. Can be set/reset by the user 11-29: Special purpose flags. Can be set/reset by the user. Those sometimes have a special meaning: 11: Automatic Execution Flag. If set the HP-41C automatically begins executing the current program whenever the calculators turned on 14: Card Reader Overwrite Flag. When set, flag 14 allows you to overwrite write-protected cards with the optional card reader 21: Printer Enable Flag. Printing is enabled when this flag is set 22, 23: Data Entry Flags. These two flags detect keyboard input. The calculator sets flag 22 when numeric data is entered from the keyboard and flag 23 when alpha data is entered. Both flags are cleared each time calculator is turned on 24, 25: Range Error And Error Ignore Flags. That these flags control how the HP-41C reacts to range errors and operating errors. If flag 24 is set range errors are ignored and numbers such as 9.999999999x1099 are returned in place of errors. Flag 24 remains set until you clear it. If flag 25 set other errors are ignored. Flag 25 is cleared each time an error occurs 26: Audio Enable Flag. When set tones are produced

	27: User Mode Flag. This flag is used to place the calculator in user mode 28, 29: Number Display Control Flags. Flag 28 controls the radix and separator marks. It may be set for American or European styles. When flag 29 is set groups of three digits are separated with commas or points depending on the setting of flag 28. 30-55: System flags. Can only be tested: 30: Catalog Flag. For internal use 31-35: Peripheral Flags. These flags are used internally for the operation of certain peripherals 36-39: Number Of Digits. These flags are used internally to control the number of digits displayed 40, 41: Display Format Flags. These flags control the display mode 42, 43: Trigonometry Mode Flags. When flag 42 is set the calculator is in GRAD mode. When flag 43 a set the calculator is in RAD mode 44: Continuous On Flag. If flag 44 is on the HP-41C will stay on indefinitely. If it is clear the calculator will turn off after 10 minutes of inactivity 45: System Data Entry Flag. Used internally and always tests clear 46: Partial Key Sequence. Used internally and always tests clear 47: Shift Set Flag. Used internally and always tests clear 48: Alpha Mode Flag. When the HP-41C is in alpha mode flag 48 is set, otherwise flag 48 is clear 49: Low Battery Flag. When this flag is set battery power is low. The BAT annunciator will also show in the display when this flag is set 50: Message Flag. If set, the display contains some message (not the Alpha or X register) 51: SST Flag. Used internally and always tests clear 52: PRGM Mode Flag. Used internally and always tests clear 53: I/O Flag. When set, a peripheral extension is ready for I/O. Otherwise device is not ready for I/O 54: Pause Flag. When set a PSE (pause) instruction in a program is in progress 55: Printer Existence Flag. When set, an HP-41C printer is attached to the calculator.
CHS	Change sign of X
CLA	Clear ALPHA register
CLD	Clear display and the displayed register (either X or ALPHA)
CLP	"CLP ALPHA <prg name> ALPHA" deletes the specified program "CLP ALPHA ALPHA" deletes the current program
CLRG	Clear all data registers
CLΣ	Clear statistics register. See ΣREG
CLST	Clear all stack register
CLX	Clear X register
COPY	Copy a user program
COS	Cosine using current trigonometry mode
D-R	Convert degrees (360) to radiants (2π)
DEC	Convert X register from octal to decimal
DEG	Set trigonometry mode degrees (360)
DEL	PRGM mode: Delete nnn commands starting with the current one.

DSE	Decrement and skip if equal or less. „DSE nn" operates on data register nn and depending on the test skips or executes the next program line. The data register must initially be loaded with a value of the form `ccccc.tttdd` where ccccc is the current counter value, ttt is the test value and dd is the decrement value (increment value for the ISG command). The DSE command will substract dd from ccccc and compare the result to ttt. If the result is less than or equal to ttt the next program line will be skipped. See RCL for indirect addressing modes
END	Ends a program and separates multiple „global" prorgams. A global program can contain multiple „local" subprograms which end with RTN
ENG	Select engineering display format rounded to n+1 valid digits where the exponent is always a multiple of 3 and the mantissa is ≥ 1. This does not affect the internal representation of the number. See RCL for indirect addressing modes
ENTER↑	Push the stack
E↑X	Exponential function base e
E↑X-1	Calculate $(e↑x) - 1$, used for very small values of X
FACT	Faculty von X (X!). Does not allow for negative or non-integer values.
FC?	Check whether flag nn is clear. See CF PRGM mode: If the condition is true the next program step is executed, otherwise it is skipped. RUN mode: The test result is displayed (YES or NO)
FC?C	Check whether flag nn is clear and then clear it. See CF
FIX	Select fix point display format rounded to n valid digits after the decimal point. Will automatically switch to SCI format if the number gets too big or too small. This does not affect the internal representation of the number. See RCL for indirect addressing modes
FRC	Fractional part of X
FS?	Check whether flag nn is set. See CF
FS?C	Check whether flag nn is set and then clear. See CF
GRAD	Set trigonometry mode „grad" (400)
GTO	Go to a label or program line number. Does never execute any program instructions! See RCL for indirect addressing modes. RUN mode: „GTO nn" goes to the local label 00 – 99 of the current program „GTO ALPHA <character> ALPHA" goes to the given local label of the current program „GTO ALPHA <name> ALPHA" goes to the given global label. „name" may have up to 7 characters PRGM mode: „GTO nn" inserts a jump instruction to the given local label 00 - 99 „GTO ALPHA <character> ALPHA" inserts a jump instruction to the given local label „GTO ALPHA <name> ALPHA" inserts a jump instruction to the given global label. „name" may have up to 7 characters PRGM and RUN mode: „GTO . nnn" goes to the program line number nnn of the current program „GTO . EEX nnn" goes to the program line number 1nnn of the current program (for program with more than 1000 lines) „GTO . ALPHA <character/name> ALPHA" goes to the specified local or

	global label. „GTO .." packs program memory and goes to the unused program memory area to be able to enter a new program. In PRGM mode „ss REG nnn" is displayed where nnn is the amount of available program registers (with about 6 commands per register).
HMS	Convert X from decimal to hour/min/sec (h.mmss) representation Example: 1.5 HMS results in 1.3000
HMS+	Add Y + X → X in h.mmss format
HMS-	Subtract Y - X → X in h.mmss format
HR	Convert X from hour/min/sec (h.mmss) to decimal representation.
INT	Integer part of X
ISG	Increment and skip if greater. See DSE. See RCL for indirect addressing modes
LASTX	Recall the most recent value of the X register
LBL	Enter a local numerical label (00–99), a local character label (A – J and a – j) or a global character label (2 – 7 characters or a non-local single-character label) in a program. In USER mode the program code at a local character label of the current program can directly be executed by pressing one of the two top row keys. Ie. pressing "1/x" executes the code at local label "B". This works for labels "A" – "J". Pressing "SHIFT 1/x" executes the code at label "b". This works for labels "a" – "j" Note that if a key has been assigned to a function or program using the ASN command no local labels are executed. Local labels are only visible within the current global program. **Warning**: You can enter a "global" program that starts with a local label. However, after the focus moved away from this program (ie. by executing another program or by executing "GTO..") you cannot easily access this program!! A GTO to the local label or an XEQ will fail with NONEXISTENT. Also, it is not possible to use "CLP" to delete the memory occupied by the program! The only way to move the focus to this "hidden" program is to use "CATALOG 1" and carefully watch for an "END" that is not preceeded with a global label. After the listing has been stopped when this "END" is displayed switching to PRGM mode will display the program and it is possible to delete it step-by-step to reclaim program memory.
LN	Logarithm base e
LN1+X	Calculate ln(1+x), used for small values of x
LOG	Logarithm base 10
MEAN	Mean value of data in the statistics registers. See ΣREG
MOD	Modulo (reminder) of division Y/X
OCT	Convert X register from decimal to octal
OFF	Turn calculator off
ON	Turn calculator on. If the „←" key is held down while turning on a **global reset** is executed and all data, stack and program registers as well as user flags are cleared
P-R	Convert polar coordinates (X=angle, Y=length) to rectangular coordinates (X,Y) using current trigonometry mode
PACK	Pack the program memory
%	Percent. This does not pop the stack
%CH	Percentual difference from Y to X. This does not pop the stack
PI	π = 3.1415…

PROMPT	Display the ALPHA register and wait until the user enters a number and presses R/S
PSE	Pause the program for a second and display the X register. X can be modified during the pause and the program will continue if no key is pressed for one second
R↑	Rotate stack up
R-D	Convert radiants (2π) to degrees (360)
R-P	Convert rectangular coordinates (X,Y) to polar coordinates (X=angle, Y=length) using current trigonometry mode
RAD	Set trigonometry mode radiants (2π)
RCL	Get the value of a register to X. Addressing modes: „RCL nn" gets value of register nn (00 – 99) „RCL SHIFT nn" gets the value of the register which is addressed by register nn (indirect addressing) „RCL . r" gets a stack register where r is one of the keys labelled X, Y, Z, T or L (without pressing ALPHA) „RCL SHIFT . r" gets the value of the register which is addressed by register r=X, Y, Z, T or L (indirect addressing) „RCL Σ+" is the same as „RCL 01" „RCL 1/x" is the same „RCL 02" etc. up to „RCL TAN" is the same as „RCL 10". This also works in USER mode Registers 00 – 99 can be addressed directly. Higher registers must be accessed thru indirect addressing. If the recalled register contains an ALPHA string it will be displayed but it will not overwrite the contents of the ALPHA register. If a register contains an ALPHA string it cannot be used for indirect addressing
RDN	Rotate stack down (same as R↓)
RND	Round the X register according to the number of valid digits as specified in the current ENG, SCI or FIX command
RTN	PRGM mode: Return to calling program or stop if at the top level RUN mode: Go to line number 0 of the current program (="GTO 000")
SDEV	Calculate standard deviation of the data in the statistics registers. See ΣREG
SCI	Select scientific display format rounded to n+1 valid digits. This does not affect the internal representation of the number. See RCL for indirect addressing modes
SF	Set flag nn. See CF
SIN	Sine using current trigonometry mode
SIGN	Replace X with the sign of X, either +1 or -1
SIZE	Specify number of data registers. Ie. „SIZE 050" reserves space for 50 data registers (00 – 49) for STO/RCL operations. The remaining memory can be used for programs where one register can approximately hold 6 program steps. Storage registers >99 can only be accessed using indirect addressing, see RCL command. It is not possible to delete existing programs with the SIZE command. You may have to erase programs first before memory space can be assigned to data registers
SQRT	Square root
SST	PRGM mode: Go to next program step RUN mode: Execute next program step. The command is displayed when the

	SST key is pressed and held down
ST+	Add X to data register nn. Same as „STO +". See RCL for indirect addressing modes
ST-	Subtract X from data register nn. Same as „STO -". See RCL for indirect addressing modes
ST*	Multiply data register nn with X. Same as „STO *". See RCL for indirect addressing modes
ST/	Divide data register nn by X. Same as „STO /". See RCL for indirect addressing modes
STO	Store X in data register nn. See RCL for indirect addressing modes
STOP	PRGM mode: Insert a stop instruction which will halt program execution. Programm can be continued using R/S in RUN mode
Σ+	Add data to the statistics registers and replace X with the number of values in ΣREG. See ΣREG.
Σ-	Substract data from the statistics registers and replace X with the number of values in ΣREG. See ΣREG.
ΣREG	Set the base register number for the 6 statistics registers. Ie. „ΣREG 11" uses registers 11 to 16 (default): 11: Sum of X values 12: Sum of X*X values 13: Sum of Y values 14: Sum of Y*Y values 15: Sum of X*Y values 16: Number of values
TAN	Tangent using current trigonometry mode
TONE	Play a tone with a frequency proportional to n (0 – 9). The argument can indirectly be obtained from a register: „TONE SHIFT 00" uses the number in data register 0 as frequency parameter
VIEW	Display contents of register nn without overwriting the X register. Press ← to return to normal stack display. See RCL for indirect addressing modes
X=0? X≠0? X<0? X<=0? X>0? X=Y? X≠Y? X<Y? X<=Y? X>Y?	Check whether X is 0 and other comparisn operations. PRGM mode: If the condition is true the next program step is executed, otherwise it is skipped. RUN mode: The test result is displayed (YES or NO)
X<>	Swap X register with data register nn. See RCL for indirect addressing modes
X<>Y	Swap X and Y register
XEQ	Execute a built-in function or user program. A maximum of 6 user-subroutines can be stacked. Ie. „XEQ ALPHA MEAN ALPHA" calculates the statistical mean value. See RCL for indirect addressing modes
X↑2	Square of X
Y↑X	Y to the power of X. Y may be negative if X is integer